Purpose and Need Statement

PID# 76691

LIMA 75 ALLEN 75 STUDY

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

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1.0 EXECUTIVE SUMMARY

The Ohio Department of Transportation (ODOT) in cooperation with the Federal Highway Administration (FHWA) is proposing to correct geometric deficiencies, improve pavement and bridge conditions, and increase transportation efficiency within the Interstate 75 (I-75) corridor in Allen and Auglaize counties, Ohio.

I-75 is important for long-distance state and national travel, as well as being a major thoroughfare for local and regional mobility. I-75 connects Lima with Toledo and Detroit to the north, and Cincinnati, Atlanta and Miami to the south. I-75 within Ohio, and the railroads that run parallel to it, are among the nation's busiest for the movement of people and goods. According to FHWA estimates, I-75 is among the busiest trucking routes in North America, with truck traffic approaching six billion miles annually. In addition, more than 250 freight trains per day pass through or have destinations within Ohio's I-75 corridor (ODOT, 2004).

The project study area is located along 12 miles of I-75 in Allen and Auglaize counties, Ohio (Figure 1), and includes portions of the city of Lima, the village of Fort Shawnee, and Bath, Perry and Shawnee townships in Allen County; and the village of Cridersville, and Duchouquet Township in Auglaize County. The study area (Figure 2) is approximately 14.4 square miles in size. It contains a variety of land use types, ranging from urban to farmland, with development and cultivation located in close proximity to the interstate and its associated interchange ramps.

This study was initiated due to the deteriorating bridge conditions and inadequate pavement performance of I-75 between logpoints[1] 0.00 and 9.05 in Allen County (between the Auglaize County Line, and SR 81), as well as the numerous design deficiencies that exist on I-75's main travel lanes, at its interchanges, and on overpasses. Because of problems with the sub-base, the surface pavement treatments (resurfacings) fail more rapidly than surface pavement on similar roadways. This makes maintenance more costly, as well as more inconvenient for motorists.

In terms of roadway deficiencies, particular concerns are the narrow outside shoulders of I-75 throughout the study corridor, and the narrow inside shoulders along the median barrier section. Narrow shoulders present a potential safety hazard and make maintenance of traffic difficult when lanes are blocked through maintenance, construction, crashes and vehicle breakdowns. The problems caused by inadequate shoulder widths are greater for trucks, which are wider than passenger vehicles, and need more room to maneuver. This section of I-75 has a high proportion of trucks, averaging 40 percent of the total traffic.

This study has prompted the examination of the adequacy of the existing facility to meet traffic demand in future years, in order to determine if additional capacity is required. The study will also explore the adequacy of existing interchanges on I-75 and the associated connections to the local road network.

[1] Logpoints are similar to mileposts. Logpoints 0.00 to 9.05 represent the first 9.05 miles of I-75 in Allen County (beginning at the Auglaize County border).

2.0 PURPOSE AND NEED STATEMENT

The purpose of the study is to develop ways to address the following transportation issues identified in the study area:

Roadway Deficiencies – Deteriorating bridge and pavement conditions, narrow shoulders, and other design deficiencies have been identified on I-75 in the study area. These deficiencies lead to problems including increased maintenance costs; increased risk of crashes; and increased delay during crashes, breakdowns, or scheduled construction.

Safety – Within Allen County, some of the areas with the highest number or rate of crashes during the 2001 to 2003 period were located in and around the SR 117/309 interchange with I-75. This area has numerous access points (driveways), and poor geometrics. Portions of I-75 within the study area also have a higher crash rate than similar urban interstates in Ohio. This study will examine what improvements should be made to improve safety along state routes and interstates within the study area.

Inclusion in Statewide or Local Plans (Transportation Demand) – This study is included in *Access Ohio*, ODOT's long-range transportation plan, and in the State Transportation Improvement Plan (STIP). It is also in the Lima-Allen County Regional Planning Commission (LACRPC)[2] *2025 Long Range Fiscally Constrained Transportation Plan Update*, dated October 2000. In addition, research done for the 2000 ODOT report, *Ohio's Interstate System 50 Years of Service (1945 – 2005)*, indicated that this section of I-75 is "a suitable candidate for major rehabilitation efforts."

Capacity – Traffic levels have grown substantially over the past decade on this section of I-75 and are expected to continue to grow. Projections indicate that the level of service[3] (LOS) will be at or below "D" in the design year if no changes are made to I-75.

Each of the above issues is discussed in detail in Section 5.0.

The project goals, which were developed through public involvement, are to:

1. Improve pavement and bridge conditions on I-75
2. Improve safety by upgrading to current state and federal design standards
3. Provide sufficient capacity for future traffic
4. Minimize impacts to social, economic and environmental resources

[2] LACRPC is the metropolitan planning organization (MPO) for Allen County, and for those portions of the city of Delphos, and the villages of Bluffton and Cridersville that are located outside of Allen County.

[3] Level of Service designations range from A to F, with A being the best level of service, and F representing a roadway operating at or beyond its capacity, with frequent slowing or stopping of traffic.

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3.0 PROJECT DESCRIPTION

3.1 Project History

ODOT identified the section of I-75 through southern Allen County for further study due to deteriorating pavement and the presence of numerous design deficiencies.

Within the study area, logpoints 0.00 to 9.05 of I-75 were submitted as a case study for an ODOT report published in 2000, *Ohio's Interstate System: 50 Years of Service*. The study was initiated as an analysis of existing conditions on the interstate system, to assess the need for improvements and rehabilitation on the system's aging infrastructure.

The 2000 Interstate study concluded that "The 1950s base design, coupled with the increased loads, and costs involved in maintaining this section of roadway has made this section of Interstate a suitable candidate for major rehabilitation efforts." (ODOT, 2000)

In 2005, the following additional issues were raised through public involvement:

- Capacity and congestion concerns
- Ability of road network to provide adequate access to the interstate system for future economic development
- Safety and numerous crash sites
- Improper drainage at median concrete barrier wall
- Traffic Noise
- Increasing truck traffic
- High maintenance costs
- Lack of context-sensitive design
- Dysfunctional lighting
- Lack of good north/south connector between SR 309 and SR 81
- Poor signing

3.2 Study Area

The project study area lies along a 12-mile segment of I-75, beginning just south of the Auglaize County line at the National Road interchange (exit 118), and ending at the Bluelick Road interchange (exit 130), as shown in Figure 2. These limits were selected to encompass the portion of I-75 (logpoints 0.00 to 9.05) with inadequate pavement performance.

Five additional interchanges are included within this section of I-75, including Breese Road (exit 120), State Route 65 (exit 122), Fourth Street (exit 124), State Route 309/117 (exit 125), and State Route 81 (exit 127). Six roads pass over the interstate within the study area, including McClain Road, Hanthorn Road, Reservoir Road, Stewart Road, Bible Road, and Slabtown Road. The study area covers approximately 14.4 square miles.

The eastern and western limits of the study area generally follow the existing alignment of I-75. The study area borders encompass a 2,000-foot wide strip along either side of the interstate between the National Road and SR 81 interchanges. Additional areas extend to the east and west of I-75. The area on the east side of I-75 includes parts of

Fourth Street and SR 117. The area on the west side of I-75 includes parts of SR 81, SR 117, and SR 65. These additional areas use a 500 to 1,500-foot strip to either side of these roads, and were added to allow for interchange improvements or other modifications that might enhance traffic flow between I-75 and the local road network.

3.3 Study Area Characteristics

The study area is located primarily in Allen County, which has a population of over 108,000 (2000 US Census). Population trends are shown in Table 1 for Allen and Auglaize counties and the townships and municipalities that are part of the study area. As indicated in the table, population has decreased slightly in Allen County over the last decade, with a greater percentage loss from the urbanized areas of Fort Shawnee and Lima. Census data for Auglaize County show an overall five percent increase in population, with Cridersville experiencing a loss of 68 persons between 1990 and 2000, and the remainder of Duchouquet Township experiencing a 1.6 percent population increase in that decade.

Table 1. Population Trends 1990-2000

Area	1990 Population	2000 Population	Change in Population (#)	Change in Population (%)
Allen County	*109,755*	*108,473*	*-1,282*	*-1*
City of Lima	45,549	40,081	-5,468	-12
Village of Ft. Shawnee	4,128	3,855	-273	-7
Bath Township*	10,105	9,819	-286	-3
Perry Township*	3,577	3,620	43	1
Shawnee Township*	8,005	8,365	360	4
Auglaize County	*44,585*	*46,611*	*2,026*	*5*
Village of Cridersville	1,885	1,817	-68	-4
Duchouquet Township*	12,311	12,512	201	2

* Population counts for townships exclude areas that are part of the city of Lima and the villages of Fort Shawnee and Cridersville.
Source: 1990 and 2000 US Census.

The Ohio Department of Development projects a slight population loss over the next 25 years for Allen County. The total number of residents is anticipated to decline to approximately 106,000 in 2020, and 105,000 by 2030. This represents a population loss of about one percent per decade, a continuation of the 1990 to 2000 trends.

Population projections for Auglaize County anticipate total growth of 16.7 percent between 2000 and 2030, a growth rate of less than one-half percent annually.

3.3.1 Land Use

The study area contains a wide variety of land uses including residential, farmland, retail/commercial, institutional, warehouse and industrial uses. Development in parts of the study area is located adjacent to I-75 and its exit ramps, including commercial and low-income residential. In addition, quarries and a major reservoir lie immediately adjacent to the highway.

3.3.2 Economy

Government agencies and the finance, insurance and real estate industries continue to serve as anchors within the central business district of Lima. Manufacturing is a major employer in the Lima metropolitan area, providing 22.6 percent of the jobs in Allen and Auglaize counties in 2003. Manufacturers in Allen County produce a variety of products including automobile engines, military tanks, electrical generators, petroleum products, chemicals, universal joints, drive shafts, soap products, and miscellaneous plastics (LACRPC, 2000). Many of these employers are reliant on truck transportation, using I-75 to ship their products throughout Ohio and beyond.

3.3.3 Road Network

I-75 is a major north-south interstate that passes through Allen and Auglaize counties. It links Lima and other Allen County communities to Toledo and Detroit to the north, and Dayton, Cincinnati, and Lexington, Kentucky to the south. I-75 continues further south to Atlanta and Miami, linking the Great Lakes with the southern tip of the US East Coast.

In addition to providing for local and regional mobility needs within the Lima/Allen County region, I-75 is one of the nation's busiest corridors for the movement of people and goods according to FHWA estimates (ODOT, 2003).

Four state routes intersect with I-75 in the study area:

- **State Route 65** is a north-south roadway through Allen County that travels through downtown Lima. The Central Point Industrial Park, as well as warehouses and other businesses, are located just north of I-75 on either side of SR 65.

- **State Route 309**, which connects Delphos and Elida in northwestern Allen County through Lima to Kenton in Hardin County, is lined with commercial development in the vicinity of I-75. SR 309 is one of the major roads leading to the Allen County Fairgrounds, which lies one mile east of I-75. SR 309 also leads to the Ohio State University Lima Campus (James A. Rhodes State College). SR 309 intersects with SR 117 in the I-75 interchange area, where they become concurrent.

- **State Route 117**, also known as Bellefontaine Road, connects Bellefontaine in Logan County to Lima, and then runs east to Spencerville and Rockford. Like SR 309, SR 117 is also lined with commercial development in the vicinity of I-75, and connects to the county fairgrounds. SR 117 also connects to the Allen County Airport.

- **State Route 81**, like SR 65, 309, and 117, also passes through the city of Lima, where it is known as Allentown Road and Ada Road. East of I-75 it connects to Ohio Northern University in Hardin County.

4.0 LOGICAL TERMINI AND INDEPENDENT UTILITY

4.1 Logical Termini Selection

The northern terminus of the project is the Bluelick Road interchange area (exit 130). The southern terminus is just south of the Auglaize County line at the Cridersville exit (exit 118 onto National Road). The study area encompasses the section of I-75 that was identified as having deteriorating pavement conditions (logpoints 0.00 to 9.05 within Allen County), extending north and south to the nearest interchanges.

Neither of the adjoining pavement sections (i.e., I-75 to the north and south of the study area) exhibits the same severity of distresses as the project section. As described in Section 5.1, pavement in the section between log points 0.00 and 9.05 degrades much faster than the average pavement for similar sections in ODOT's District 1, leading to short life cycles and more frequent and more expensive repairs than for the adjoining sections. ODOT research indicates that the pavement condition rating (PCR) for the segment of I-75 within the study area falls below the deficient PCR value of 65 in eight years.

By contrast, the pavement south of the project section has had recent minor rehabilitation projects on an approximate ten-year interval (1984, 1993, and 2004).

The pavement north of the project area was last rehabilitated in 1999 and has a current PCR of 85 (as of November 2005). At its current rate of deterioration, there is still another five to six years of service life remaining in this pavement, giving it an overall projected life of 11 to 12 years. This is in line with what ODOT District 1 expects from a composite pavement with the traffic loading this section of I-75 carries.

4.2 Independent Utility

Improvements to I-75 will have a value independent of the completion of any other transportation projects in the area, and independent of improvements to other sections of I-75 north or south of Allen County.

Regardless of other improvement projects, the correction of pavement performance problems and roadway deficiencies on I-75 will reduce delays and potential safety problems for drivers traveling within or through the area.

5.0 TRANSPORTATION ISSUES

This project has identified five issues that make up the purpose and need:

- Pavement Performance
- Roadway Deficiencies
- Safety
- Inclusion in Statewide or Local Plans (Transportation Demand)
- Capacity

5.1 Pavement Performance

Poor pavement performance is the main factor that led to the development of this project. Deteriorating pavement on I-75 in the study area creates two problems: higher levels of financial expenditures on road maintenance; and higher maintenance needs resulting in frequent lane closures for scheduled road maintenance. Lane closures result in increased traffic delay for both local and long-distance travelers, including trucks, which make up almost 40 percent of the traffic using this section of I-75.

The section of I-75 between logpoints 0.00 and 9.05 in Allen County has historically demonstrated poor pavement performance and has been described as having "a history of failing at a rapid rate", *Ohio's Interstate System: 50 Years of Service (1945-2005),*

2000. The I-75 corridor in Allen County was originally constructed in 1955 with a nine-inch reinforced concrete pavement and a six-inch aggregate sub-base. It was first overlayed in 1973, 16 years after the original construction was complete. It has been overlayed or repaved five times between 1973 and 2004. The most recent pavement improvements to this section were completed in 2004, when it was milled to a two-inch depth and resurfaced. The resurfacing projects since 1973 have resulted in an average service life of just under eight years, while the design life was expected to be 12 years.

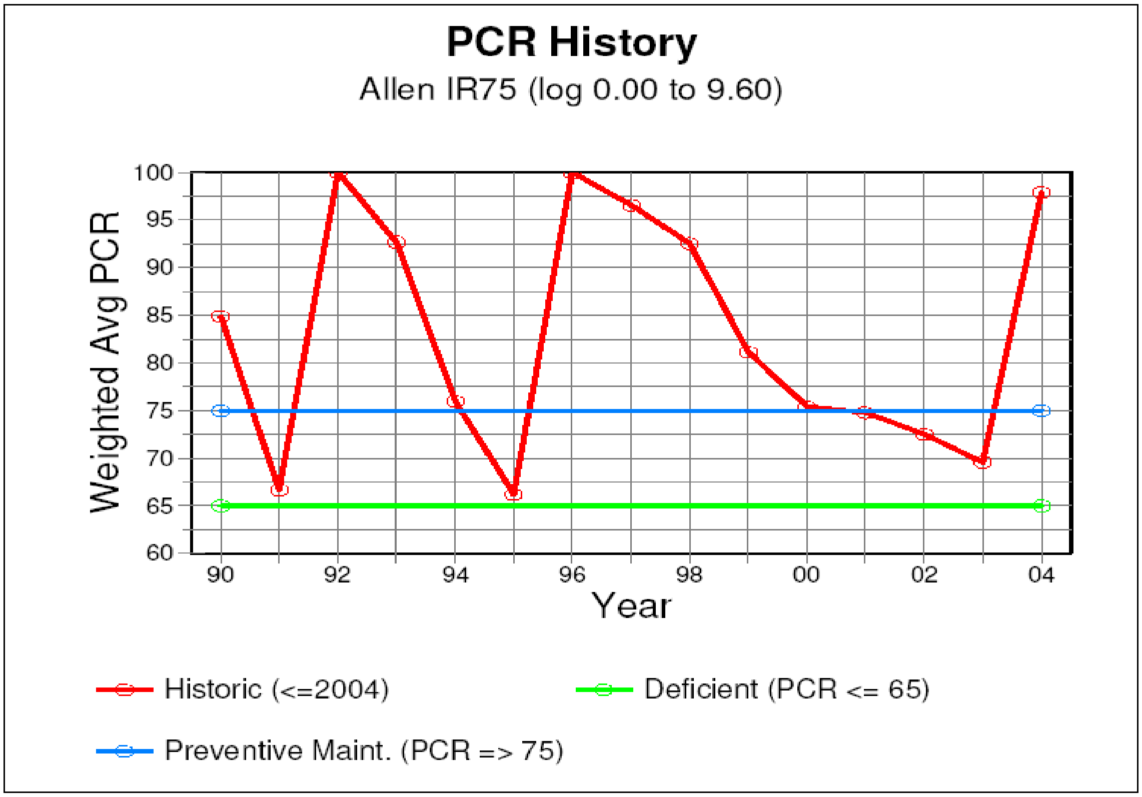
Approximately 65 percent of the original concrete joints have been replaced during rehabilitation projects in 1983, 1991 and 1996. Recent partial depth repairs and pavement cores indicate that many of the remaining original joints, and some of the replaced joints have failed. Approximately 15 percent of the joints were repaired with full depth asphalt in 1996. However, 2003 pavement testing indicated that even with intermediate full depth asphalt patches, the pavement still functions as a rigid pavement. The only exception is in areas under overheads and near bridge approaches, where extensive areas were repaired with full depth asphalt.

This section of pavement was not designed or constructed for current traffic using I-75. It was constructed with a design life of approximately four million equivalent single axle loadings (ESALs), which defines the damage to pavement over expect design life. In comparison, using 2002 traffic data, the current design loading is approximately 76 million ESALs.

Another deficiency of this section of I-75 is the poor sub-base below the concrete pavement. Underdrains were constructed in 1973 and additional drainage updates were made in 1983. Full depth pavement replacement at the mainline and overhead bridges took place in 1991. The sub-base was found to be wet and unstable at that time. During the 1996 rehabilitation project, new four-inch shallow underdrains were installed. However, prior to resurfacing again in 2004, symptoms of re-occurring sub-base problems were evident.

Poor pavement performance of this section of I-75 is documented by annual pavement condition rating (PCR) data. Over the past 15 years, the PCRs for this section of pavement have degraded at a higher rate than the typical composite pavement in District 1 as shown in Figure 3.

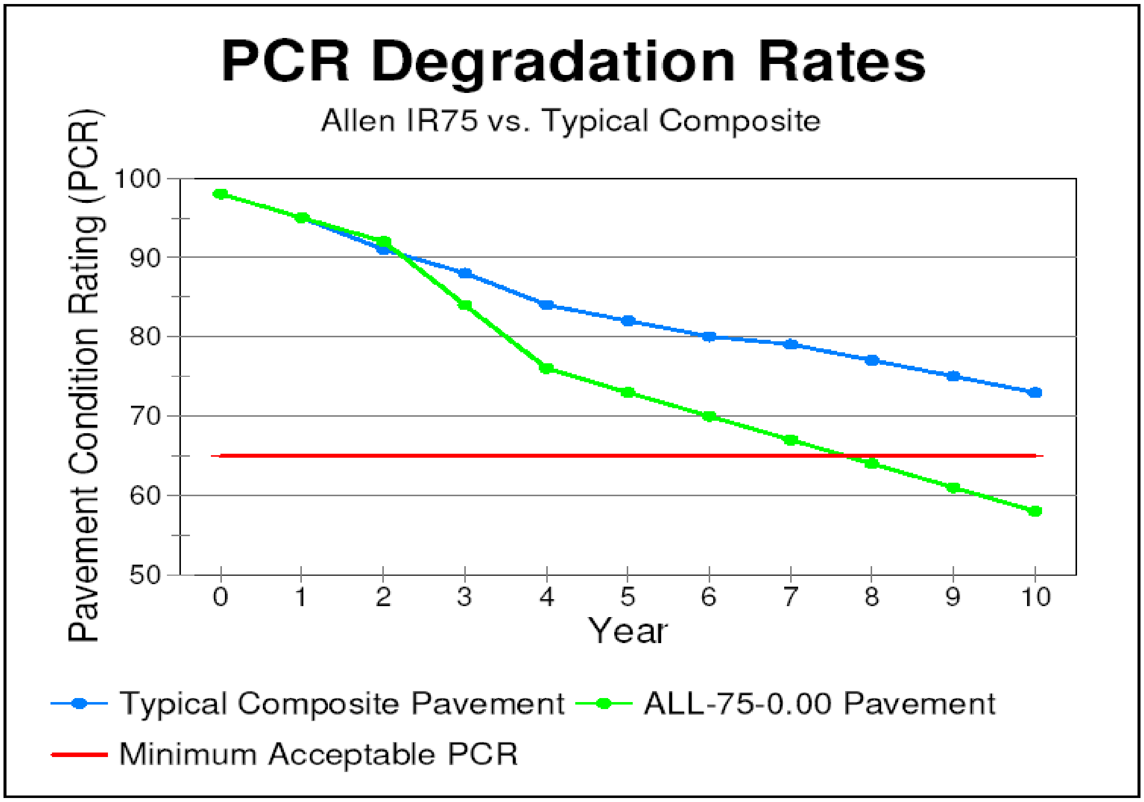
Figure 3. Pavement History for the Allen 75 Corridor



Source: Ohio Department of Transportation, District 1

Annually, ODOT analyzes and computes the standard degradation rate of each unique pavement type in each ODOT district. These degradation rates are used to predict future PCR values, as shown in Figure 4. Some sections of pavement do not conform to the calculated standard PCR degradation rates, and are adjusted to reflect how a section of pavement actually performs. The adjusted degradation rates for this section of pavement indicates the PCR falls below the deficient PCR value in eight years. By contrast, the average composite four-lane pavement in District 1 does not fall to a deficient level until 12 to 14 years.

Figure 4. Pavement Degradation on Allen 75 Corridor



Source: Ohio Department of Transportation, District 1

5.2 Roadway Design Deficiencies

Some of the design deficiencies on I-75 are due to the age of the facility. I-75 in Allen County (from logpoints 0.00 to 17.80) was one of the early interstate construction projects in the state of Ohio, constructed between 1952 and 1955. Traffic volumes, truck sizes, and roadway design standards have changed over the past 50 years, leaving I-75 with narrow shoulders, low bridge heights and clearances, and other design deficiencies.

Inadequate shoulders and other roadway design deficiencies can present safety hazards, make maintenance of traffic difficult, and contribute to traffic delays when crashes, vehicle breakdowns, or scheduled roadwork block a lane. These problems will only increase as traffic levels grow. With higher traffic volumes, the potential for crashes and breakdowns (which can cause lane blockages) increases. Higher volumes also increase the amount of delay experienced by drivers during any given period of lane blockage, particularly during rush hours. As described in Section 5.4, increases in overall traffic as well as freight traffic are expected on I-75 by 2032.

5.2.1 Shoulder Deficiencies

The entire length of I-75 within the study area, including both the northbound and southbound lanes, lacks outside shoulders that meet current ODOT standards. The existing outside (right) shoulder has a 15-foot graded width, of which 10 feet is paved. Current criteria for urban-area interstates (ODOT *Location and Design Manual*, 2004) requires outside shoulders to have a 17-foot graded width (with barrier), of which 12 feet should be paved. In addition, the criteria for the paved inside shoulder (median or left shoulder) on an urban interstate is four feet compared to the 2.75 feet currently found throughout the median barrier section of I-75. Shoulders on interchange ramps within the study area are also narrower than current standards require. Shoulder deficiencies along I-75 are detailed in Table 2, and shown on Figure 5.

Narrow shoulders on an interstate present an increased safety risk, as well as make maintenance of traffic difficult when construction, crashes, or breakdowns cause lane closures. Shoulders on interstates are typically designed to allow for two lanes of traffic flow during repairs, resurfacing, or reconstruction of the traveled lanes. Narrow shoulders are a particular problem on roads with high volumes of truck traffic, as trucks are generally wider than passenger vehicles. Trucks make up an average of 40 percent of total traffic on I-75 in the study area, and 25 percent of peak hour traffic volume.

5.2.2 Other Roadway Design Deficiencies

In addition to narrow shoulders, other design deficiencies found within the study area include inadequate lateral clearance (support piers of bridges that serve as overpasses are too close to the traffic lanes passing underneath), inadequate structural capacity of the mainline bridges, inadequate vertical clearance of overhead structures, poor sight distances at three points, tight curves and inadequate super elevation (the banking or cross-sectional sloping of a road where it curves). These problems are found on the main travel lanes of I-75 as well as on its ramps. More detailed information is provided in Table 2 for the I-75 mainline and its ramps. Table 3 provides detail on deficiencies related to bridges that are part of the facility, including overpass bridges over I-75. Locations for the deficiencies listed in both tables are identified in Figure 5.

Most of the ramps that make up the interchanges between SR 81 and Breese Road are designed below the "Ramp Speed Design Guide" included in ODOT's *Location and Design Manual*. Many of the ramps are designed for speeds between 25 and 35 miles per hour. While this is allowed under ODOT standards for existing roads (not for new construction), the slow design speed of ramps makes merging into full-speed mainline traffic difficult and potentially dangerous. The problems caused by slow ramp design speeds are exacerbated by the fact that all the acceleration lanes (merge lanes) in this segment of I-75 are too short to meet the latest ODOT criteria. Short acceleration lanes at on-ramps to the interstate do not allow sufficient time for entering vehicles to attain full speed in time for a safe merge into mainline traffic.

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Table 2. Design Deficiencies on I-75 Mainline Lanes and Ramps

Description	ODOT Standard	Existing Condition	Location(s)
Outside shoulder graded width (mainline)	17 feet with barrier; 12 feet without barrier	15 feet	Entire length of I-75 mainline within study area.
Outside shoulder paved width (mainline)	12 feet	10 feet	Entire length of I-75 mainline within study area.
Inside shoulder width	4 feet	2.75 feet	The portion of I-75 mainline with a median barrier.
Inside shoulder graded width (one-way ramps)	9 feet	7 feet	All one-way ramps between and including the SR 81 and Breese Road interchanges.
Outside shoulder paved width (one-way ramps)	6 feet	3 feet	All one-way ramps between and including the SR 81 and Breese Road interchanges.
Inside shoulder paved width (two-way ramps)	3 feet	6 inches	Fourth Street Ramps A, B, C & D; SR 117 Ramps A & B.
		1 foot	SR 117 Ramps F & G.
Outside shoulder paved width (two-way ramps)	6 feet	3 feet	SR 117 Ramps F & G.
Superelevation (banking of roadway at curves)	0.036	0.032	PI sta. 64+31.82 Dc = 1 degree. Located near Little Ottawa River crossing.
	0.028	0.024	PI sta. 98+00.00 Dc = 0 degrees, 40 minutes. Located south of Breese Road exit.
	0.066	0.064	PI sta. 501+25.84 Dc = 2 degrees. Located north of SR 81 exit.
Stopping sight distances	Sag: 730 feet Crest: 730 feet	Sag 471 feet	PVI sta. 365+25.
		Crest 680 feet	PVI Sta. 372+00.
		Sag 602 feet	PVI Sta. 380+00.
Acceleration lanes (length and taper)	Varies depending on grade and design speed.	Varies, but in all cases does not meet applicable criteria.	All on-ramps between and including the SR 81 and Breese Road interchanges.
Layout of interchange ramps	Should be exclusive (not incorporating portions of local roads).	Incorporates two-way local roads as part of ramp design.	Yoder Road (part of the I-75/SR 65 interchange); Dean Avenue (part of the I-75 interchange with SR 117/SR 309).
Tight curves (mainline)	2 degrees 45 minutes	3 degrees 00 minutes	West of McClain Road overpass.
			South of Hanthorn Road overpass.

Abbreviations:
Dc = degrees of curvature
PI = point of intersection
PVI = point of vertical intersection
Sta. = Station (location on I-75)

Table 3. Design Deficiencies on Bridges (Underpasses and Overpasses)

Description	ODOT Standard	Existing Condition	Location(s)
Mainline bridge lateral clearance (outside shoulder)	10 feet	3 feet	All-75-0423 over SR 65 – L&R. All-75-0448 over Indiana & Ohio Railway tracks – L&R. All-75-0703 over SR 117/SR 309. All-75-0813 over CSXT tracks. All-75-0832 over the Ottawa River. All-75-0875 over SR 81.
Mainline bridge lateral clearance (inside shoulder)	3.5 feet	3 feet	All-75-0423 over SR 65 –L&R. All-75-0448 over Indiana & Ohio Railway tracks – L&R.
		2.75 feet	All-75-0703 over SR 117/SR 309. All-75-0813 over CSXT tracks. All-75-0832 over the Ottawa River. All-75-0875 over SR 81.
Structural capacity of mainline bridges (designed capacity, not based on condition)	HS-25	HS-20 or less	All mainline bridges.
Horizontal clearance of overpasses	11.5 feet to face of pier	10.0 feet	All-75-0212 (Breese Road) –NB&SB. All-75-0328 (McClain Road) NB&SB. All-75-0508 (Hanthorn Road) NB&SB. All-75-0611 (Fourth Street) NB&SB.
		9.0 feet	All-75-0785 (Reservoir Road) NB&SB.
Vertical clearance of overpasses (measured from edge of pavement)	16 feet	15.00 feet NB 15.92 feet SB	All-75-0212 (Breese Road).
		15.42 feet NB 15.42 feet SB	All-75-0328 (McClain Road).
		14.83 feet NB 15.25 feet SB	All-75-0508 (Hanthorn Road).
		15.00 feet NB 14.75 feet SB	All-75-0611 (Fourth Street).
		14.75 feet NB 14.58 feet SB	All-75-0785 (Reservoir Road).

Abbreviations:
CSXT = CSX Transportation (a railroad company)
L&R = both left and right structures (where separate bridge structures exist to carry the northbound and the southbound lanes)
NB = northbound
SB = southbound

5.3 Safety

The study area includes areas that have high rates or numbers of crashes, both on I-75 and on surrounding roads. With traffic volumes projected to increase by more than 30 percent between 2002 and 2032 (ODOT Office of Technical Services, 2005), without improvements the number of crashes in this area is expected to grow.

Crash data on I-75 for the years 2001 through 2003 are summarized by segment in Table 4. The average crash rate for four-lane urban interstates throughout Ohio during the 2001 to 2003 period is 1.347 crashes per million vehicle miles (mvm) (2004 ODOT Office of Planning). Table 5 shows the type of crashes occurring on I-75 within the study area. Most crashes are passing side-swipes and rear-end collisions, or are related to unsafe speeds, deer, or weather-related road conditions.

Table 4. Crash Data and Crash Rates for I-75 within the Study Area

I-75 Segment	Length	Crash Frequency			Average Crash Rate
		2001	2002	2003	
Auglaize County Line to Breese Road	2.12	4	3	4	0.137
Breese Road to SR 65 (St. Johns Road)	2.11	15	16	21	0.579
SR 65 (St. Johns Road) to 4th Street	1.88	28	30	33	1.095
4th Street to SR 309 / 117	0.92	27	22	25	1.795
SR 309 / 117 to SR 81 (Ada Road)	1.72	38	30	46	1.354
SR 81 (Ada Road) to Bluelick Road	3.08	25	33	48	0.848

Source: Ohio Department of Public Safety, 2004.

Table 5. Type of Crashes on I-75 Mainline and Ramps

Type of Crash	Mainline	Ramp	Overall
Head-On	0%	0%	0%
Read End	10%	19%	13%
Side-Swipe Passing	14%	8%	12%
Animal Related	13%	0%	9%
Fatigue/Asleep	2%	0%	1%
Pedestrian	0%	0%	0%
Fixed Object	7%	8%	8%
Unsafe Speed & Unsafe Speed (Wet)	7%	31%	15%
Ran Off Road Right	2%	8%	4%
Ran Off Road Left	1%	3%	1%
Ice and Snow Related	22%	13%	19%
Cargo or Equipment Loss or Shift	4%	2%	3%
Equipment Failure	4%	0%	3%
Other Crash Types	15%	7%	12%

Source: Ohio Department of Public Safety, 2004.
Note: Percentages are for the portion of I-75 between Breese Road and Bluelick Road.

Crash statistics obtained from ODOT for the *Highway Safety Program* listing of Freeway High Crash locations and Non-Freeway High Crash locations show that three segments of I-75 and three non-freeway segments within the study area are included in the *ODOT's Freeway and Non-Freeway High Crash Locations* data. Additionally, the intersection of SR 309 with SR 117 and the adjacent roadway segment are included on the *ODOT's Safety Hotspots* and *Congested Areas.*

Observed crash rates at the intersections of local roads and/or state routes within the study area occur at higher frequencies than in other parts of Allen County. The LACRPC identified 52 high-frequency crash locations in Allen County for the years 2001 to 2003. Seven of the 52 high-frequency crash locations are located within the study area (Table 6).

Table 6. High-Frequency Crash Locations Within the Study Area

Intersection Location	Number of Crashes (3-year total, 2001-2003)
SR 117/SR 309	29
SR 309 and SR 117	27
SR 117 and Leonard Avenue (just west of I-75)	24
SR 117/SR 309 and Roschman Avenue (just east of I-75)	24
SR 81 and Sugar Street	21
Dana Street and Bellefontaine Road	19
Bluelick Road and Slabtown Road	18

Source: *Traffic Crash Incident Summary Report; Allen County, Ohio, 2001 through* 2003, Lima-Allen County Regional Planning Commission, June 2004.

The first four intersections identified in Table 6 are located in the vicinity of the I-75 interchange with SR 117/SR 309. There are problems with this interchange area, including the fact that the intersection of two major state routes, SR 117 and SR 309, is located only 650 feet from the northbound off-ramp of I-75. The area is surrounded by hotel, retail/commercial and residential uses with numerous access points (driveways) in close proximity to I-75. Furthermore, the only access to northbound I-75 from westbound SR 117/309 is via a neighborhood street (Figure 6). This forces local and long-distance traffic to share the same roads and ramps, increasing the potential for driving conflicts.

5.4 Inclusion in Statewide or Local Plans (Transportation Demand)

According to the FHWA's *Technical Advisory T6640.8A*, which provides guidance on preparing Purpose and Need Statements, one of the possible justifications for a transportation improvement project is its inclusion in "any statewide plan or adopted urban transportation plan." The Technical Advisory terms this "Transportation Demand." (Capacity-related demand issues are discussed in Section 5.5.)

The Allen 75 project is included in *Access Ohio*, ODOT's long-range transportation plan, and in the four-year State Transportation Improvement Program (STIP). It is in the LACRPC *2025 Long Range Fiscally Constrained Transportation Plan Update*, dated October 2000 as well. In addition, ODOT's review of the Ohio interstate system stated that "The 1950s base design, coupled with the increased loads, and costs involved in maintaining this section of roadway has made this section of Interstate a suitable candidate for major rehabilitation efforts." (ODOT, 2000)

5.5 Capacity

5.5.1 Traffic Volumes on I-75 Mainline and Ramps

Traffic has grown substantially over the past decade along the portion of I-75 within the study area, and is forecasted to continue to grow through the design year of 2032.

Figure 6. Photos of Exit 125 Area (SR 117/309 Interchange with I-75)

Eastern approach to the interchange

Approach to I-75 NB ramp

Access to the I-75 NB entrance ramp

Two sets of ODOT traffic projections were obtained for the portion of I-75 within the study area. One set was completed prior to 2000 and is based on 1995 traffic counts (Table 7). More recent projections were based on 2002 traffic counts, with forecasts completed in 2004 (Table 8). An indication of the considerable growth in the volume of traffic using this segment of interstate is that the 2002 actual counts are substantially higher than the traffic levels projected for 2005 just a few years earlier.

The 2002 data in Table 8 show higher traffic counts on the mainline between Breese Road and SR 81, with lower counts to the north and south. This indicates that I-75 is being used for local trips as well as long-distance travel. This was confirmed by additional traffic counts taken in 2005 (Parsons Brinckerhoff, 2005). The lack of an adequate north-south route in the local road network forces local traffic to use the freeway.

Table 7. 1995 Traffic Counts and Projections on I-75
(Forecast completed prior to 2000)

Section of I-75 Measured as Logpoints (i.e., miles from the Auglaize County Line)	1995 Average Annual Daily Traffic	2005 Average Annual Daily Traffic	2020 Average Annual Daily Traffic
0.00 to 3.28 (Auglaize County Line to McClain Road overpass)	29,237	33,966	41,060
3.28 to 4.23 (McClain Road to SR 65)	24,656	28,645	34,628
4.23 to 4.72 (SR 65 to near Hanthorn Road)	25,899	30,088	36,372
4.72 to 6.13 (Near Hanthorn Road to Fourth Street)	25,955	30,152	36,451
6.13 to 7.03 (Fourth Street to SR 117/SR 309)	29,940	34,782	42,047
7.03 to 8.75 (SR 117/SR 309 to SR 81)	31,345	36,415	44,021
8.75 to 9.00 (SR 81 interchange area)	23,412	27,201	32,882

Source: ODOT-Office of Technical Services, 2000.

Table 8. 2002 Traffic Counts and Projections on I-75
(Forecast completed in 2004)

Section of I-75	2002 Average Annual Daily Traffic	2012 Average Annual Daily Traffic	2032 Average Annual Daily Traffic
Auglaize County Line to Breese Road	37,650	45,478	61,133
Breese Road to SR 65	38,810	43,635	53,286
SR 65 to Fourth Street	40,350	45,251	55,053
Fourth Street to SR 117	40,910	45,582	54,927
SR 117 to SR 81	44,700	50,103	60,908
SR 81 to Bluelick Road	36,410	41,088	50,445

Source: ODOT-Office of Technical Services, 2005.

Based on the information presented in Table 8, Figure 7 shows that the level of service (LOS) for some segments of the I-75 mainline is expected to be “D” or worse in the design year of 2032. The LOS on all but one of the on and off ramps within the study area is also expected to be “D” or worse in 2032 (Table 9 and Figure 7).

In ODOT’s *Location and Design Manual Volume I*, Section 301-1 states that interstate and freeway facilities should be designed to LOS C as a minimum in Metropolitan Planning Organization (MPO) areas, unless the MPO is willing to accept LOS D. The LACRPC policy committee, as well as its Long-Range Transportation Plan, have stated that LOS D is not acceptable for the design year for highway projects (LACRPC, 2004).

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Table 9. Level of Service for I-75 Interchange Ramps

LOCATION	Existing (2005) LOS	Design Year (2032) LOS
I-75 & Breese Road (Exit 120)		
I-75 NB – Breese Road	C	E
Breese Road – I-75 NB	C	E
I-75 SB – Breese Road	C	D
Breese Road – I-75 SB	C	D
I-75 & State Route 65 (Exit 122)		
I-75 NB – SR 65	C	D
SR 65 – I-75 NB	C	C
I-75 SB – SR 65	C	D
SR 65 – I-75 SB	C	D
I-75 & Fourth Street (Exit 124)		
I-75 NB – Fourth Street	C	D
Fourth Street – I-75 NB	C	D
I-75 SB – Fourth Street	C	D
Fourth Street – I-75 SB	C	D
I-75 & State Route 309/ 117 (Exit 125)		
I-75 NB – SR 309/ 117	C	D
SR 309/ 117 EB – I-75 NB	D	E
SR 309/ 117 WB – I-75 NB		
I-75 SB – SR 309/ 117 WB	C	D
I-75 SB – SR 309/ 117 EB	C	D
SR 309/ 117 – I-75 SB	C	D
I-75 & State Route 81 (Exit 127)		
I-75 NB – SR 81 EB	C	E
I-75 NB – SR 81 WB	C	E
SR 81 – I-75 NB	D	E
I-75 SB – SR 81	C	D
SR 81 – I-75 SB	D	F

Abbreviations:
NB = northbound
SB = southbound
WB = westbound
EB = eastbound

5.5.2 Traffic Volumes on Other Major Roads in the Study Area

Within the study area there are several state routes and other major roadways. LACRPC has identified “deficient and deteriorating” levels of service on a number of corridors, including the Bellefontaine/SR 117 corridor from Kibby Street to I-75, the SR 81 corridor from I-75 to North Street, and the Bluelick Road corridor from I-75 to SR 65 (LACRPC, 2000).

Traffic volumes for the existing street system surrounding I-75 are increasing, but are generally not forecasted to grow as rapidly as I-75 traffic. Traffic counts on local roads for the years 2005 and 2032 are shown in Table 10.

Table 10. Traffic Counts and Projections on Local Roads

Roadway Section	2005 Counts (vpd)	2032 Counts (vpd)
SR 65 (St. Johns Road)	7,171	9,100
Fourth Street	5,455	6,928
Kibby Street	5,360	5,437
Bellfontaine Avenue	19,660	27,091
Elm Street	12,630	18,700
SR 309 (Harding Highway)	33,690	41,149
SR 117 (Bellfontaine Road)	13,470	15,484
Greely Chapel Road	10,000	11,548
Bowman Road	3,300	4,190

Source: ODOT Central Office and 2005 ground counts collected by Parsons Brinckerhoff.
vpd = vehicles per day.

An analysis of the current and projected levels of service on the local roadway network is presented in Table 11 and shown graphically in Figure 7.

Table 11. Levels of Service on Major Roads

INTERSECTION LOCATION	Existing (2005) LOS	Design Year (2032) LOS
Signalized Intersections		
Bellfontaine Avenue and Elm Street	E	F
Bellfontaine Avenue and Kibby Street	F	F
I-75 NB Off Ramp and SR 309/117	B	C
South Dixie Highway and Breese Road	B	B
SR 65 and Fourth Street	B	C
SR 65 and Elm Street	B	C
SR 65 and Kibby Street	B	C
SR 65 and Hanthorn Road	B	B
SR 117 and Greely Chapel Road	C	C
SR 309 and SR 117	C	D
Unsignalized Intersections		
Fourth Street and Greely Chapel Road	B	C
I-75 NB Off Ramp and Breese Road	B	C
I-75 SB Off Ramp and Breese Road	B	B
Fourth Street and Bowman Road	B	B
I-75 NB Off Ramp and Fourth Street	B	B
I-75 SB Off Ramp and Fourth Street	B	B
Reservoir Road and Bryn Mawr Avenue	B	C
I-75 NB Off Ramp and SR 65	B	C
I-75 SB Off Ramp and SR 65	B	C
I-75 NB Off Ramp and SR 81 WB	F	F
I-75 SB Off Ramp and SR 81	C	E
SR 117 and Bowman Road	C	F
I-75 SB Off Ramps and SR 309	B	B
SR 65 and Pine Street	C	E

Source: Parsons Brinckerhoff, 2005.
NB = northbound
SB = southbound

6.0 CONCLUSION

I-75 within the study area is an important local and regional thoroughfare. It is also part of a major interstate truck route which extends from Michigan to Florida. The poor performance of the pavement on the section of I-75 in the study area is the main factor that led to the initiation of the Allen 75 study. Resurfacings have proven to be cost ineffective, as the pavement performance problems cause surface treatments to fail rapidly. In addition to the expense, the frequent resurfacings also cause delay and other negative impacts to local and regional motorists on I-75.

Roadway design deficiencies, capacity and safety are other concerns in the study area. The mainline lanes and access ramps of I-75 in the study area have numerous design deficiencies, including narrow shoulders and poor sight distances. These deficiencies can increase the risk of crashes and contribute to delay when lanes are blocked and traffic is diverted to the shoulders. Capacity is a concern in the design year, as LOS D is expected on the mainline and ramps in 2025 and beyond. This level of service is considered unacceptable by local officials, as well as ODOT design standards for MPO areas.

This project will examine the ability of this segment of I-75, as well as its interchanges, to meet the increased traffic demand that is expected in 2032, including the anticipated growth in truck traffic.

Existing state and local plans call for improvements to this section of I-75, including *Access Ohio* (the long-range transportation plan), the STIP, LACRPC's long-range transportation plan, and a 2000 ODOT report on the condition of the state's interstate roadways (*Ohio's Interstate System: 50 Years of Service*).

Potential benefits of this project include an improved level of service, reduced potential for crashes and delays, and increased efficiency for the many trucks and other commercial vehicles using this segment of I-75. These benefits will enhance the quality of life for residents of the Lima/Allen County region and the commuters who work in the area. Commerce will also benefit, as local and long-distance trips along I-75 through Allen County become more reliable with the reduction in travel delays.

For these reasons, the goals of the Allen 75 study are to:

1. Improve pavement and bridge conditions on I-75
2. Improve safety by upgrading to current state and federal design standards
3. Provide sufficient capacity for future traffic
4. Minimize impacts to social, economic and environmental resources

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